

UNITED STATES PATENT OFFICE

2,301,945

SOCKET WRENCH

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Application March 7, 1941, Serial No. 382,177

3 Claims. (Cl. 81—124.1)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to a socket wrench, and has for an object to provide a socket wrench, preferably of the screw driver type, which includes a socket magazine or socket wrench set in the handle thereof.

A further object of this invention is to provide a socket wrench which has means for storing a predetermined number of socket units within a preferably transparent counterbored handle, whereby the socket units are visible, yet protected.

A further object of this invention is to provide a socket wrench having a shank on which both the active and the spare socket units are carried, which shank may be readily separated and reattached for exchanging one socket for another in the operative position.

Still a further object of this invention is to provide a split or separable shank on a wrench which can be quickly and easily separated and rapidly reunited, and when so reunited is held positively in joined position against accidental separation.

Still a further object of this invention is to provide a socket wrench having a socket wrench set straight thereon and held in position by yieldable means of such tension that it acts as a tell-tale to indicate the absence of any unit from the socket wrench set.

With the foregoing and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter described and illustrated in the drawing, in which:

Fig. 1 is a longitudinal elevational view of the socket wrench of this invention, partly in section;

Fig. 2 is a detail elevational view of the lower shank element, showing some of the additional operative elements thereon in skeleton outline;

Fig. 3 is a longitudinal sectional view of the shank handle magazine;

Fig. 4 is an end elevation of the shank handle with the magazine or wrench set fully loaded;

Fig. 5 is an enlarged detail longitudinal sectional view through a socket shown in position on the end of the shank holding a screw-bolt and washer thereon; and

Fig. 6 is an end elevation of Fig. 5, with the screw-bolt omitted.

There is shown at 10 the socket wrench of this invention applied in operative position on a screw-bolt 11 and washer 12 that have either just been applied or are about to be removed from a main panel 13 through an opening 14 in a sub-panel 15. The wrench 10 includes a shank 16

divided into two separable parts, consisting of an operative wrench socket portion 17 and a handle shank portion 18, both of these parts being provided with fingers 20 and 21 of substantially equal length, the added diameters of the fingers 20 and 21 being substantially equal to the diameter of the shank portions 17 and 18, one of the fingers being provided with a boss 22 while the other finger is provided with a correspondingly positioned mating slot 33, so that when the fingers 20 and 21 are moved transversely into abutting position they are incapable of separation in a longitudinal direction. The shank 16 is generally hexagonal in outline, the shank portion 17 terminating in a swaged end 24 while the shank portion 18 extends through a counterbore 25 of a wrench handle 26, preferably of transparent dielectric plastic, which is molded about the end 27 thereof, this end 27 of shank portion 18 being similarly hexagonal but being provided with one or more recessed necks 28 for the material of the handle 26 to flow into when being molded so as to more firmly grip the same.

Cooperating with the shank 16 are a plurality of wrench sockets 30 and 31 to 35, inclusive, of graduated sizes, each of them being provided with a hexagonal opening 37 of a size that will just snugly fit over the shank 16, but will not fit over the swaged end 24 of shank portion 17, the maximum diameter of the largest wrench socket 35 being slightly less than the internal diameter of the counterbore 25 of the handle 26.

The socket magazine or socket wrench set is preferably of such a number of units that they can all but one be stored within the counterbore 25, leaving one active unit to be carried adjacent the swaged end of shank portion 17.

As shown in Figs. 5 and 6, each wrench socket may also be provided with a leaf spring 38 having one end anchored as at 40 within the socket unit and extending through a groove 41 and having a turned end 42 extendable through an appropriately placed aperture in the side of the socket opening. This leaf spring is so tensioned that it normally remains in the position shown at 43 when there is no pressure thereon, but may retreat into the groove and aperture when the socket is placed over the screw-bolt head 11, and possibly also the washer 12, as shown in Fig. 5, thereby holding both the screw-bolt and washer within the socket, ready for application or removal from an operative position.

In order to hold the shank portions 17 and 18 in the assembled position 16 there is provided a coil spring 44 of a diameter to fit about the shank

16. In addition there are provided one or two sleeves 45, counterbored at one end as at 46 so that the end of the spring 44 may seat therein. While only a single sleeve may be used, it is preferable to use two sleeves 45, as shown in Fig. 1, with the spring 44 placed therebetween. The tension in coil spring 44 should be such that the added length of the coil spring 44 in extended position and the sleeves 45 will normally occupy the space between the active wrench socket 30 on the adjacent swaged end 24 of socket portion 17 and the outermost unit 31 of the set of wrench sockets stored in counterbore 25 of handle 26. It should also be sufficiently yieldable to permit the sleeve 45 to be retracted from over the abutting fingers 20 and 21 to the position shown in Fig. 2, permitting transverse separation of the socket portions 17 and 18, as shown in Figs. 2 and 3, whereupon the sleeves and spring may be removed from the shank portion 17, permitting the wrench sockets to be interchanged to place the needed sizes on the shank portion 17 adjacent its swaged end, after which it may be reassembled to the position shown in Fig. 1. In this position, however, the spring 44 should not be extendable a distance more than the length of one wrench socket, so that should one or more wrench sockets be missing from stored position, the sleeve and spring will be loose or limp, acting as a tell-tale of the fact that at least one wrench socket is missing from the magazine position within the handle counterbore 25.

While, as shown, the socket wrench set used in this invention consists of a half dozen wrench sets, one in active position and five in magazine position, it is obvious that for certain types of work a deeper counterbore and greater number of wrench sockets may be provided, and similarly, it is obvious that shank 16 may be of any desired length, with the sleeves and springs correspondingly lengthened. Obviously, even both sleeves could be omitted, whereupon the spring itself would be of a length and strength to abut the active wrench socket and the stored wrench socket.

The invention thus above described is of the general nature shown in U. S. Patent No. 1,371,350, but has the advantage thereover that the wrench sockets are stored in protected yet visible position and that a shank of any desired length may be utilized which may reach the work through a sub-panel to a main panel, as shown in Fig. 1, without interference by the presence of any sockets thereon beyond the handle.

Other modifications and changes in the number and arrangement of the parts may be made by those skilled in the art without departing from the nature of this invention, within the scope of what is hereinafter claimed.

The invention described herein may be manu-

factured and/or used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. A socket wrench comprising a shank transversely separable into a wrench socket portion and a handle portion, means for holding said shank in assembled position with an active socket on one end of the shank and a plurality of sockets stored on the shank at the handle end thereof, each of said sockets having an opening therethrough of a size and shape to fit snugly yet slidably on said shank, and means for holding said active socket on said one end of said shank against loss thereover while in use comprising an enlarged swaged end on said shank over which said socket cannot pass.

2. A socket wrench comprising a shank transversely separable into a wrench socket portion and a handle portion, means for holding said shank in assembled position with an active socket slidably retained on one end of the shank against loss thereover and a plurality of stored sockets at the handle end of the shank, and means in said active socket for releasably retaining a nut or bolt-head therein comprising a recessed slot longitudinally extending therethrough, and a yieldable leaf spring longitudinally extending through said socket but recessable into said slot for engagement with the nut or bolt-head in holding relation thereto, whereby said active socket may be slid along said shank to release a nut or bolt-head stuck therein.

3. A socket wrench comprising a shank transversely separable into a wrench socket portion and a handle portion, means for holding said shank in assembled position with an active socket on one end of the shank and a predetermined plurality of stored sockets at the handle end of the shank, said holding means comprising complementary fingers extending longitudinally from said shank portions, means locking said fingers against longitudinal separation, said locking means comprising transversely interengaging lug and slot means on said fingers, a sleeve encompassing said fingers, and yieldable means holding said sleeve in finger encompassing position, said active socket providing a base for said yieldable means, said yieldable means comprising a coil spring of such predetermined length and tension in relation to said predetermined plurality of stored sockets that said coil spring will be visibly loose if less than said predetermined plurality of stored sockets be in position, thus acting as a tell-tale should at least one socket be missing.

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